

Appl. No. 09/751,215
Amendment dated January 31, 2005
Reply to Office Action of October 29, 2004

IN THE CLAIMS

Please amend the following claims.

1. (currently amended) A method for forming hardened interconnects comprising:
depositing a metal layer to serve as an interconnect line; comprising copper and an additional
introducing a single metal species comprising beryllium or a combination of metal species selected from the group consisting of silver, aluminum, zinc, zirconium, and magnesium to the metal layer over a semiconductor wafer surface wherein said copper and said additional metal species comprising beryllium are co-deposited; and
heating the deposited metal layer and the introduced metal species;
allowing the metal layer to cool, so as to form precipitates of the introduced metal species; and
after allowing said heated metal layer to cool, performing chemical-mechanical polishing wherein the additional metal precipitate hardens said deposited metal layer to reduce the rate of said polishing.
after co-depositing said metal layer comprising said copper and said additional species comprising beryllium allowing said heated metal film to cool, performing chemical-mechanical polishing of said deposited metal layer comprising copper and the additional metal species comprising beryllium wherein said additional metal species hardens said deposited metal layer to reduce the rate of said polishing.

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2. (cancelled)

3. (currently amended) The method of claim 1, wherein depositing the metal layer ~~comprising copper~~ and the additional metal species comprising beryllium comprises depositing the metal layer and the additional metal species over an at least one opening in an insulating layer formed over the semiconductor wafer surface.

4. (currently amended) The method of claim 3 1, wherein ~~the additional metal species comprising beryllium forms a solid solution in~~ the deposited metal layer is copper.

5. (previously presented) A method for forming hardened interconnects comprising:
depositing a metal film over a semiconductor wafer surface;
introducing an additional metal species comprising beryllium to the metal film;
heating the deposited metal film with the introduced metal species;
allowing the metal film to cool, so as to form precipitates of the introduced metal species; and
after allowing said heated metal film to cool performing chemical-mechanical polishing wherein the additional metal precipitate hardens said deposited metal film to reduce the rate of said polishing.

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6. (previously presented) The method of claim 5, wherein the deposited metal film is copper.

7 - 21 (cancelled)

22. (new) The method of claim 5, further comprising introducing a solute selected from the group consisting of silver, aluminum, zinc, zirconium, chromium, and magnesium before heating the deposited metal film with the introduced metal species.